

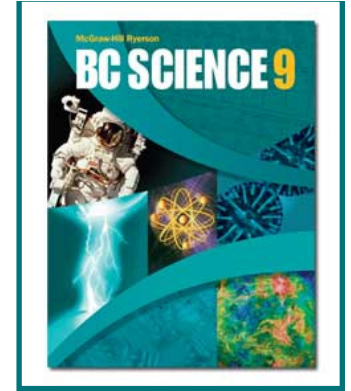
These notes are posted on my site for the following reasons:

- **for students to copy in their own hand-writing**
 - **in order to complete their class notes**
 - **if student did not have enough time in class**
 - **if student was away and missed this section**
- **for assistants and tutors to follow progress of the concepts taught**

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3.3 Physical and Chemical Changes



- In physical changes, the appearance of a substance changes, but the chemical bonds holding the substance together do not change. Examples: melting, freezing, boiling
- In chemical changes, new substances are produced in the process of breaking chemical bonds and forming new ones.
 - Evidence of chemical change:
 - Colour change
 - Heat, light, sound produced or consumed
 - Bubbles of gas form
 - Formation of a precipitate
 - The change is difficult to reverse

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Energy Changes

- In both physical and chemical changes, energy changes take place. This energy change can mean releasing to or absorbing energy from the environment.
- Exothermic reactions involve the overall release of energy in the form of heat and light.
- Endothermic reactions involve the overall absorption of energy.



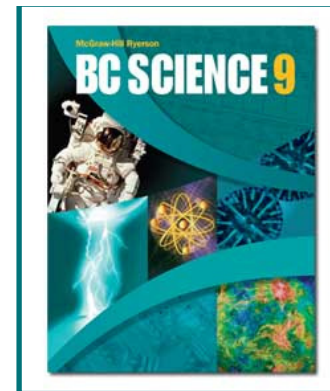
Instant Cold Pack: Endothermic



Campfire: exothermic

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Applications of Chemical Changes



- Some chemical changes present problems, while others provide opportunities and advantages
- Corrosion is major problem for steel structures - by protecting steel surfaces, the chemical reaction of iron with oxygen can be prevented.
- First nations people of the Pacific Coast have used smoking as a means of preserving food. Smoke causes chemical changes in meat that kill bacteria.

Take the Section 3.3 Quiz

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